

 <p><b>Spectrum Research &amp; Testing Lab., Inc.</b>  No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li Dist., Taoyuan City 320, Taiwan (R.O.C.)</p>	<h1>TEST REPORT</h1>	Reference No.: A23070303 Report No.: FCCA23070303-E0 FCC ID : QCI-SKIWB800D3 Page: 1 of 45 Date: Aug. 02, 2023
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Product Name: BT/BLE/WiFi 6 radio module  
Brand Name: SMART  
Model No.: SKI.WB800D.3  
Series Model: ---  
Applicant: SMART TECHNOLOGIES ULC  
3636 RESEARCH ROAD NW CALGARY, AB T2L 1Y1  
CANADA

Date of Receipt: Jul. 03, 2023  
Finished date of Test: Jul. 27, 2023  
Applicable Standards: 47 CFR Part 15, Subpart C, 15.247  
ANSI C63.10: 2013  
FCC publication KDB 558074 D01 15.247 Meas Guidance v05r02 Apr 02, 2019

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Jimmy Tseng , Date: Aug. 02, 2023  
(Jimmy Tseng)

Approved By : Johnson Ho , Date: 8/2/2023  
( Johnson Ho, Director )





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## Revisions History

Report No.	Issue Date	Revisions
DGTA23070303-E0	Aug. 02, 2023	Initial issue.



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## 1. DOCUMENT POLICY AND TEST STATEMENT

### 1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- FCC Registered Test Site Number : TW1016

### 1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source from DC 5V

### 1.3 EUT MODIFICATION

- No modification in SRT Lab.

### 1.4 DECISION RULE

- To make sure the testing report(s) meet the requirement of ISO/IEC 17025:2017 standard and meet chapter 7.1 (Review of Requests, Tenders and Contracts), chapter 7.4 (Handling of Test or Calibration Items), chapter 7.8.2 (Reporting of Results – Common Requirement for Reports (Test, Calibration or Sampling)), This decision rule will be the base of adjustment (include the disclaimer scope) from SRT LAB.
- After communicate between SRT LAB. and clients /applicants and get the agreement, SRT LAB. will do the adjustment. According to this decision rule, SRT LAB. Manager(s) will do the Pass or Fail adjustment. (But one thing need to be concerned is, not every assessing rule suits all declaration of conformity assessing actions, it should be ruled depends on product's feature, test standard, technical regulation, test results, and also acceptance of risk of both sides.)
- This report according to the "description of applied standards and statements of conformity" on the report, as the decision rule.

### 1.5 REPORTING STATEMENTS OF CONFORMITY

Base on ISO/IEC 17025, the statements of conformity requirement of testing results.

- It does not need to provide the statements of conformity.
- It need to provide the statements of conformity and
  - Use CISPR 16-4,ISO/IEC Guide 98-3, IEC Guide 115,etsi ETR 028 speciation and it does not need to provide additional uncertainty of the testing results or data on the report(s).
  - It need to provide additional uncertainty of the testing results or data on the report(s).



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## 2. DESCRIPTION OF EUT AND TEST MODE

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	BT/BLE/WiFi 6 radio module
<b>MODEL NO.</b>	SKI.WB800D.3
<b>BRAND NAME</b>	SMART
<b>POWER SUPPLY</b>	5Vdc 1A
<b>CABLE</b>	N/A
<b>FREQUENCY BAND</b>	2400 ~ 2483.5 MHz
<b>CARRIER FREQUENCY</b>	2402 ~ 2480 MHz
<b>NUMBER OF CHANNEL</b>	40
<b>RATED RF OUTPUT POWER</b>	1.67 dBm (1.469 mW)
<b>MODULATION TYPE</b>	GFSK
<b>BIT RATE OF TRANSMITTER</b>	1 Mbps, 2 Mbps
<b>ANTENNA TYPE</b>	Dipole Antenna
<b>ANTENNA GAIN</b>	3.19 dBi

**NOTE:**

For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

### 2.2 DESCRIPTION OF EUT INTERNAL DEVICE

<b>DEVICE</b>	<b>BRAND / MAKER</b>	<b>MODEL #</b>	<b>FCC ID / DOC</b>	<b>REMARK</b>
RF IC	AICSEMI	AIC8800D	N/A	WIFI 6 BT5.0 Moudle
XTLA	N/A	M26.00	N/A	26MHz XTAL
Front end IC	CHIPBETTER	CB5717	N/A	WIFI 6 5G Front-end Module
Antenna	HONGFUTAI	Dipole	N/A	2.4G paek Gain 3.19dbi 602-0015-065-A
Antenna	Megahertz	Dipole	N/A	2.4G paek Gain 2.06dbi 6150-000000-36000001
Antenna	Megahertz	Dipole	N/A	2.4G paek Gain 3.17dbi 6150-015600-36000001



## 2.3 DESCRIPTION OF TEST MODE

The EUT in BLE mode has 40 channels and the modulations are GFSK,  $\pi/4$  DQPSK, and 8DPSK.

Use the software in TX test mode is "SecureCRTPortable".

After pre-test in chamber and evaluate:

1. GFSK was the worst modulation, so use of GFSK for the final test mode.
2. Choose lowest, middle and highest channels for final test.
3. Three axis (X, Y and Z axis) are evaluated in chamber, the X axis is the worst in test.

Test Mode	Frequency	Conducted Emission	Radiated Emission	
1	TX1	2402 MHz	N/A	✓
2	TX2	2441 MHz	N/A	✓
3	TX3	2480 MHz	N/A	✓
4	Standby	N/A	✓	✓
5	Link	N/A	✓	✓

### NOTE:

1. Below 1 GHz were pre-tested in chamber and chosen the worst case for conducted and radiated emission test.
2. Above 1 GHz were tested individually.

## 2.4 EUT OPERATING CONDITION

1. Setup the EUT and all peripheral devices .
2. Turn on the power of all equipment and EUT.
3. Transfer board between PC and EUT. Into engineering & Standby mode.



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## 2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.10:2013. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL #	FCC ID/DOC	CABLE
1	PC	ASUS	M32AA1	DoC	1.8m unshielded power cable.
2	LCD Monitor	DELL	U2311Hb	DoC	1.8m unshielded power cable. 1.5m shielded data cable.
3	Mouse	ASUS	MOBTUO	DoC	1.5m unshielded data cable.
4	Keyboard	ASUS	AW211	DoC	1.5m unshielded data cable
5	Printer	HP	C8995A	DoC	1.5m unshielded power cable. 1.5m shielded data cable.
6	USB 2.0 HDD	Terasys	F-12U	DoC	1.5m shielded data cable.
7	USB Transfer board	SMART	USB TO TTL	NA	NA

**NOTE:** For the actual test configuration, please refer to the photos of testing.

## 2.6 CHANNEL AND FREQUENCY TABLE

Channel (CH)	Frequency (MHz)	Channel (CH)	Frequency (MHz)	Channel (CH)	Frequency (MHz)	Channel (CH)	Frequency (MHz)
00	2402	10	2422	20	2442	30	2462
01	2404	11	2424	21	2444	31	2464
02	2406	12	2426	22	2446	32	2466
03	2408	13	2428	23	2448	33	2468
04	2410	14	2430	24	2450	34	2470
05	2412	15	2432	25	2452	35	2472
06	2414	16	2434	26	2454	36	2474
07	2416	17	2436	27	2456	37	2476
08	2418	18	2438	28	2458	38	2478
09	2420	19	2440	29	2460	39	2480





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### 3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C, 15.247

ANSI C63.10: 2013

FCC publication KDB 558074 D01 15.247 Meas Guidance v05r02 Apr 02, 2019

All tests have been performed and recorded as the above standards.

### 3.1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT RESULTS	RESULTS
15.207	AC Power Line Conducted Emission	PASS
15.247(d) 15.205(a) 15.209(a)	Transmitter Radiated Emissions Limit: Table 15.209	PASS
15.247(a)(2)	6 dB Bandwidth	PASS
15.247(b)	Maximum Peak Conducted Output Power	PASS
15.247(d)	Band Edge Measurement:	PASS
15.247(e)	Power Density	PASS

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## 4. CONDUCTED EMISSION TEST

### 4.1 LIMIT

Frequency (MHz)	Class A (dB $\mu$ V)		Class B (dB $\mu$ V)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

#### NOTE:

- The lower limit shall apply at the transition frequencies.
- The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 4.2 TEST EQUIPMENT

The following test equipment was used for the test:

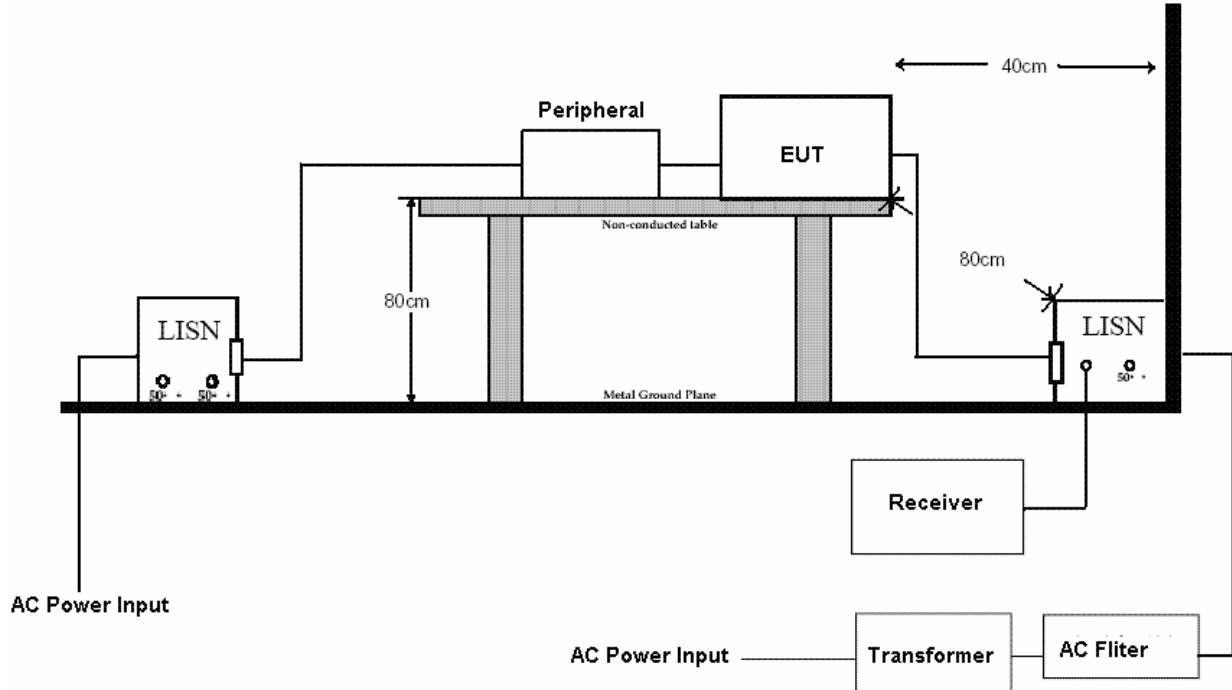
Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center	Final Test be Used
EMI TEST RECEIVER	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	APR. 26, 2024 ETC	■
LISN	50 $\mu$ H, 50 ohm	SOLAR	9252-50-R-24-BNC / 951315	FEB. 22, 2024 ETC	■
LISN	50 $\mu$ H, 50 ohm	SCHWARZBECK	NSLK 8127/ 8127-808	MAR. 08, 2024 ETC	■
50 $\Omega$ BNC TYPE TERMINATOR	50 ohm	N/A	11593A/ L1TEQU005	FEB. 14, 2024 ETC	■
50 $\Omega$ BNC TYPE TERMINATOR	50 ohm	N/A	B00-CD-357 / L1TEQU009	JUL. 14, 2024 ETC	■
COAXIAL CABLE	5 m	HUBER+ SUHNER	RG214/U(5m) / L1TCAB013	JUN. 23, 2024 ETC	■
FILTER	2 LINE, 30 A	FIL.COIL	FC-943 / 771	NCR	■
GROUND PLANE	2 m (H) x 3 m (W)	SRT	N/A	NCR	■
GROUND PLANE	2.5 m (H) x 3 m (W)	SRT	N/A	NCR	■
PULSE LIMITER	9 kHz ~ 30 MHz Insertion Loss= 10dB $\pm$ 0.3dB	ROHDE & SCHWARZ	ESH3-Z2 / L1TTES010	FEB. 16, 2024 ETC	■
THERMO-HYGRO	15 – 40 $^{\circ}$ C,	TOP	20-A / 6644	MAR. 01, 2024 ETC	■
MEASUREMENT SOFTEARE	N/A	EZ-EMC	SRT-03A1	NCR	■

#### NOTE:

The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



## 4.3 TEST SETUP



### NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.

## 4.4 TEST PROCEDURE

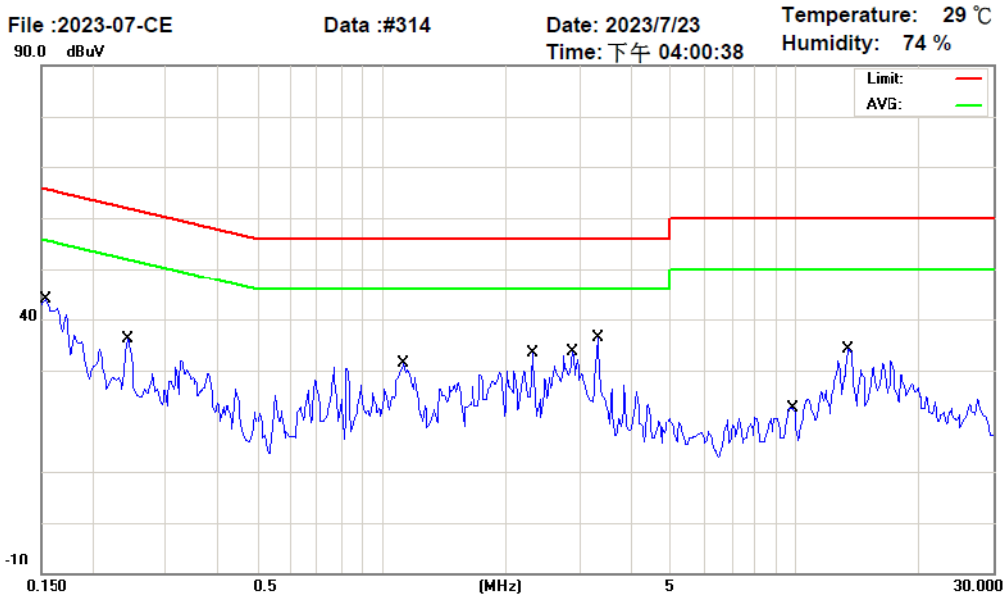
The EUT was tested according to the requirement of ANSI C63.10:2013 and EN 55022. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50 $\mu$ H as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



## 4.5 TEST RESULT

Temperature:	29 °C	Humidity:	74 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Tested Date:	Jul. 23, 2023

Power Line Measured : Line



Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1539	36.44	-0.04	36.40	65.79	-29.39	QP	
	2	0.1539	12.43	-0.04	12.39	55.79	-43.40	AVG	
	3	0.2437	35.05	-0.04	35.01	61.97	-26.96	QP	
	4	0.2437	34.77	-0.04	34.73	51.97	-17.24	AVG	
	5	1.1305	27.66	-0.02	27.64	56.00	-28.36	QP	
	6	1.1305	21.57	-0.02	21.55	46.00	-24.45	AVG	
	7	2.3102	19.77	0.02	19.79	56.00	-36.21	QP	
	8	2.3102	8.29	0.02	8.31	46.00	-37.69	AVG	
	9	2.8961	20.99	0.05	21.04	56.00	-34.96	QP	
	10	2.8961	10.50	0.05	10.55	46.00	-35.45	AVG	
	11	3.3125	35.12	0.06	35.18	56.00	-20.82	QP	
*	12	3.3125	34.66	0.06	34.72	46.00	-11.28	AVG	
	13	10.0000	12.29	0.28	12.57	60.00	-47.43	QP	
	14	10.0000	7.24	0.28	7.52	50.00	-42.48	AVG	
	15	13.3750	30.68	0.34	31.02	60.00	-28.98	QP	
	16	13.3750	22.93	0.34	23.27	50.00	-26.73	AVG	

**NOTE:**

1. Measurement uncertainty is 1.61 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN  
 Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.



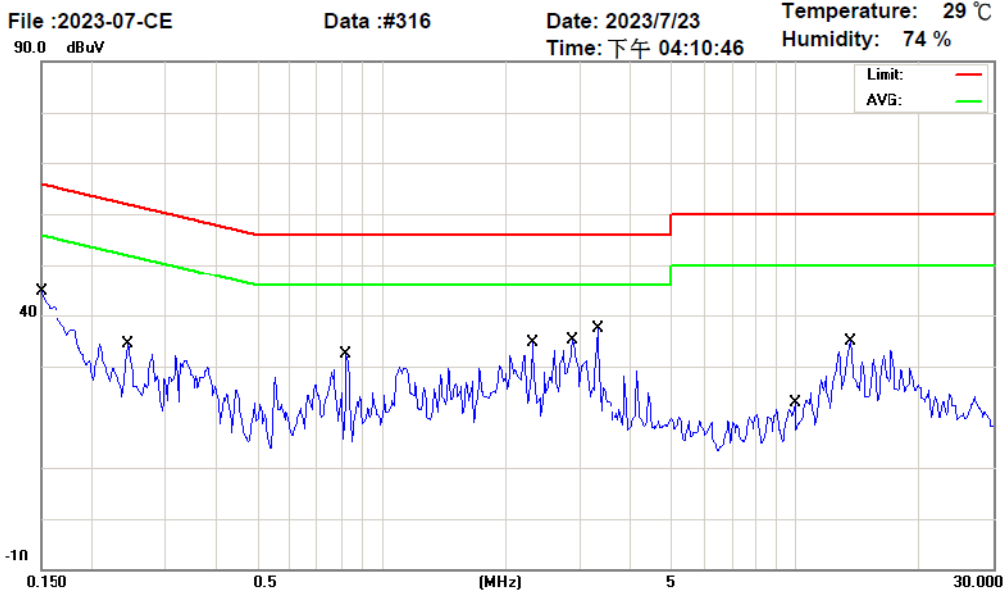
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Temperature: 29 °C Humidity: 74 %RH  
 Frequency Range: 0.15 – 30 MHz Tested Mode: Standby  
 Receiver Detector: Q.P. and AV. Tested Date: Jul. 23, 2023

Power Line Measured : Neutral



Mk.	No.	Frequency (MHz)	Reading (dBuV)	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
	1	0.1500	37.37	-0.09	37.28	66.00	-28.72	QP	
	2	0.1500	20.75	-0.09	20.66	56.00	-35.34	AVG	
	3	0.2437	32.35	-0.08	32.27	61.97	-29.70	QP	
	4	0.2437	31.82	-0.08	31.74	51.97	-20.23	AVG	
	5	0.8258	30.63	-0.06	30.57	56.00	-25.43	QP	
	6	0.8258	28.67	-0.06	28.61	46.00	-17.39	AVG	
	7	2.3141	24.30	-0.01	24.29	56.00	-31.71	QP	
	8	2.3141	8.38	-0.01	8.37	46.00	-37.63	AVG	
	9	2.8883	21.59	0.02	21.61	56.00	-34.39	QP	
	10	2.8883	9.28	0.02	9.30	46.00	-36.70	AVG	
	11	3.3125	35.83	0.03	35.86	56.00	-20.14	QP	
*	12	3.3125	35.38	0.03	35.41	46.00	-10.59	AVG	
	13	10.0000	12.67	0.25	12.92	60.00	-47.08	QP	
	14	10.0000	7.54	0.25	7.79	50.00	-42.21	AVG	
	15	13.5742	30.97	0.30	31.27	60.00	-28.73	QP	
	16	13.5742	23.09	0.30	23.39	50.00	-26.61	AVG	

**NOTE :**

1. Measurement uncertainty is 2.92 dB.
2. Result = Reading + Correction factor.
3. Corrected Factor = Cable loss + Insertion loss of LISN  
 Difference of Pulse Limiter Factor between EMI Test Receiver corrected 10dB insertion loss.
4. Margin = Result – Limit.



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## 5. RADIATED EMISSION TEST

### 5.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	FIELD STRENGTH (microvolts/meter)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
0.009 - 0.490	2400/F(kHz)	300	67.6-20log(kHz)
0.490 - 1.705	24000/F(kHz)	30	87.6-20log(kHz)
1.705 - 30	30	30	30
30 - 88	100	3	40.0
88 - 216	150	3	43.5
216 - 960	200	3	46.0
≥ 960	500	3	54.0

**NOTE:**

- 30 dBuV (in 30m) = 70 dBuV (in 3m).
- In the emission tables above , the tighter limit applies at the band edges.
- Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0



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## 5.2 TEST EQUIPMENT

Below 1 GHz The following test equipment was used during the radiated emission test:

Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center	Final Test be Used
EMI Test Receiver	9 kHz ~ 2.75 GHz	ROHDE & SCHWARZ	ESCS30 / 100376	APR. 26, 2024 ETC	■
Biconical Antenna	30 MHz ~ 200 MHz	EMCO	3108 / 2380	MAY. 01, 2024 ETC	■
LOOP ANTENNA	9 kHz ~ 30 MHz	ROHDE & SCHWARZ	HFH2-Z2 / 860605/002	JUL. 19, 2024 ETC	■
Log Periodic Antenna	200 MHz ~ 1 GHz	EMCO	3146 / 9002-2686	MAY. 01, 2024 ETC	■
Open Area Test Site	3 ~ 10 M Measurement	SRT	A02 / SRT002	MAR. 07, 2024 SRT	■
Coaxial Cable	9 kHz ~ 1 GHz	TIMES	LMR-400(30m) / L1TCAB014	Jul. 06, 2024 ETC	■
Coaxial Cable	9 kHz ~ 1 GHz	Time	LMR-400 (#2m) / L1TCAB012	MAR. 20, 2024 ETC	■
Filter	2 LINE, 30 A	FIL.COIL	FC-943 / 869	NCR	■
CDN	0.15 MHz ~ 300 MHz	LUTHI	CDN L-801 M2/M3 / 2790	JUN. 10, 2024 ETC	□
Pre-Amplifier	0.1 MHz ~ 1.3 GHz	HP	8447D / 2944A06746	APR. 19, 2024 ETC	■
Thermo-Hygro	15 ~ 40°C, 0 ~ 100% RH	TOP	20-A / 9326	MAR. 26, 2024 ETC	■

**NOTE:** The Open Area Test Site (SRT-1) is registered by FCC with No. 90957

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Above 1 GHz The following test equipment was used during the radiated emission test:

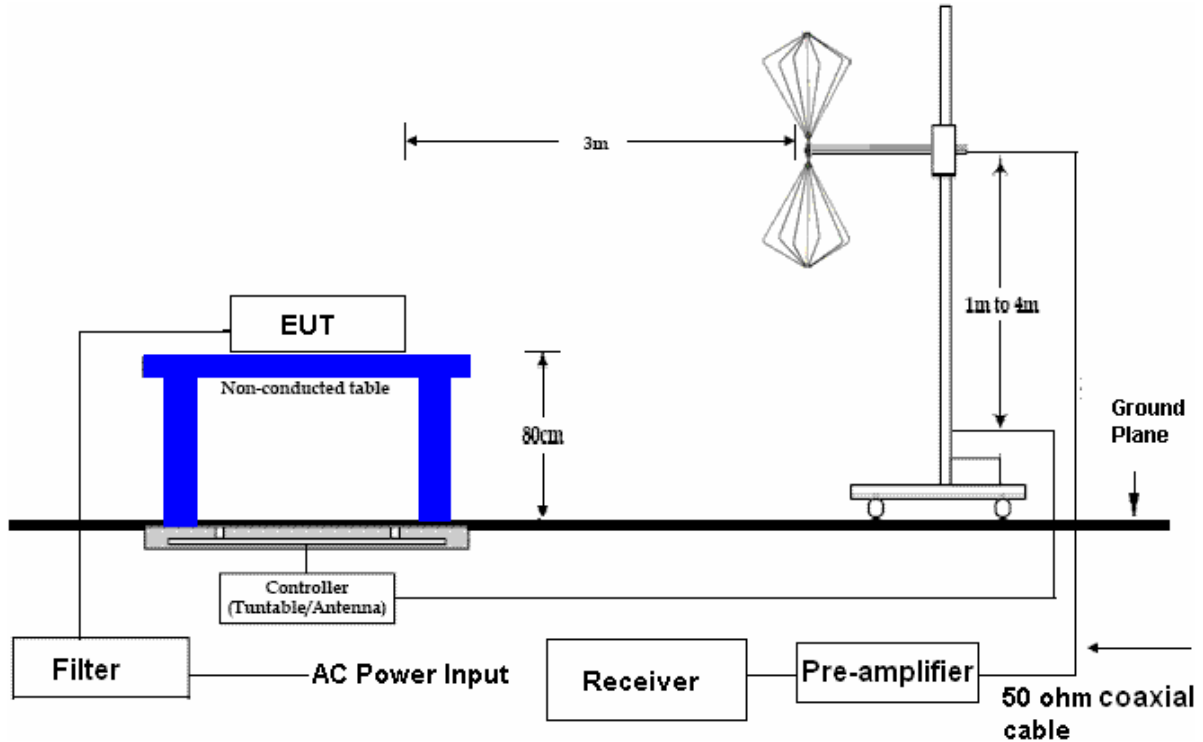
Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center	Final Test be Used
EXA Signal Analyzer	10Hz ~ 44 GHz	KEYSIGHT	N9010A / MY56480554	NOV. 22, 2023 ETC	■
Pre-Amplifier	1 GHz ~ 26.5 GHz	AGILENT	8449B / 3008A01995	MAR. 06, 2024 ETC	■
Horn Antenna	1 GHz ~ 18 GHz	EMCO	3115 / 9602-4681	FEB. 23, 2024 ETC	■
Horn Antenna	18 ~ 40 GHz	ETS-LINDGREN	3116 / 2567	MAY.13, 2024 ETC	■
Anechoic Chamber	3 M Measurement	SRT	A01 / SRT001	JUN. 22, 2024 SRT	■
RF Cable	Up to 18 GHz 6 m*2	EMCI	EMC107-SM-6000 / 230726	JUN. 14, 2024 ETC	■
RF Cable	Up to 18 GHz 1.5 m	JYEBAO	A30A30-L 142 / EQF-0035(001)	FEB. 16, 2024 ETC	■
K-Type Cable	Up tp 40 GHz 3 m	HUBER+ SUHNER	SF102-46/2*11SK252 / MY2611/2	APR. 24, 2024 ETC	■
K-Type Cable	Up to 40 GHz, 1 m	HUBER+ SUHNER	SF102/2*11SK252 / MY3331/2	FEB. 13, 2024 ETC	■
Filter	2 Line, 30 A	FIL.COIL	FC-943 / 869	NCR	■
Thermo-Hygro	15 ~ 40 °C, 0 ~ 100% RH	TOP	20-A / 6644	MAR. 01,2024 ETC	■
Measurement Software	N/A	EZ-EMC	SRT-03A1	NCR	■
Notch Filter	NF2400-2500MHz	EMCI	E-024	Dec.09.2022	■



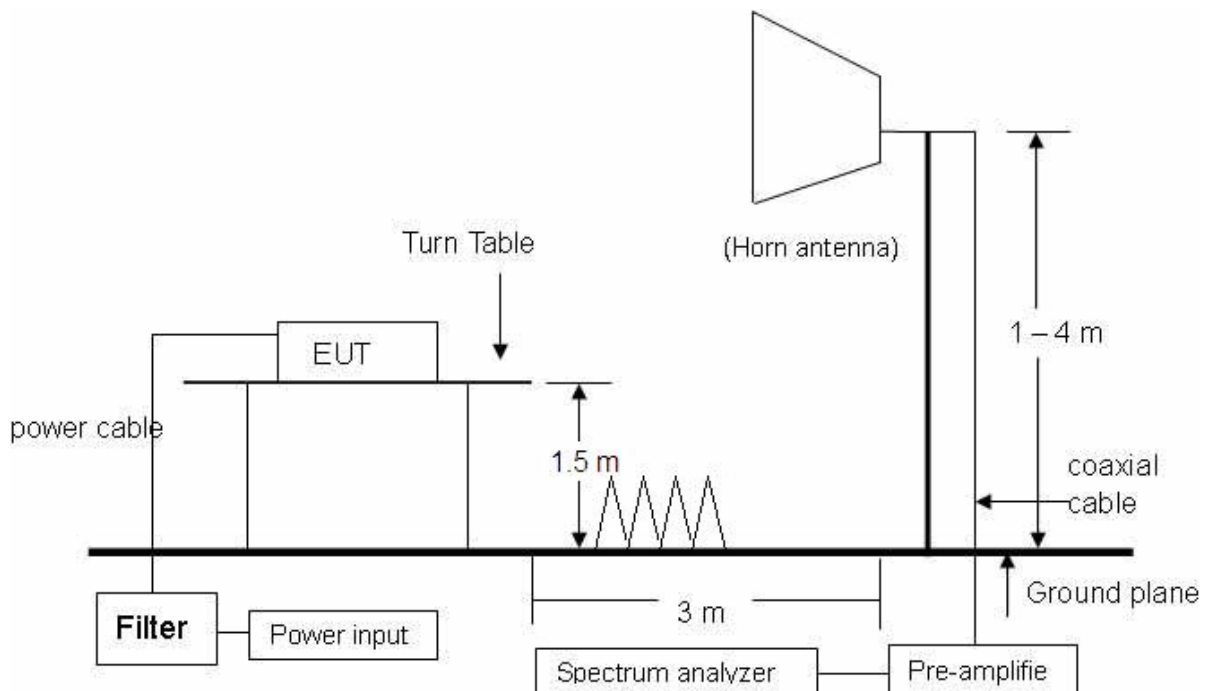


## 5.3 TEST SET-UP

### 30 MHz ~ 1 GHz



### Above 1 GHz



**NOTE:** The EUT system was put on a Styrofoam table with 1.5m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.



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## 5.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.10:2013 and EN 55022. When the frequency spectrum measured started from 9 kHz to 30 MHz, then use antenna is a loop antenna. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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## 5.5 TEST RESULT

Temperature: 29 °C Humidity: 76 %RH  
 Frequency Range: 30 MHz ~ 1 GHz Tested Mode: Standby  
 Detector Type: Quasi-peak IF Bandwidth: 120 kHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 24, 2023

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amp (dB)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ (°)	EL (m)
183.26	3.34	13.20	27.66	49.05	37.93	43.5	-5.57	67	3.53
231.76	3.87	12.62	27.49	45.31	34.31	46.0	-11.69	322	3.38
276.38	4.48	13.76	27.36	45.36	36.24	46.0	-9.76	45	3.24
303.54	4.64	15.72	27.31	43.73	36.78	46.0	-9.22	204	3.15
361.74	5.17	16.08	27.70	40.83	34.38	46.0	-11.62	80	2.97
720.64	8.29	21.50	28.36	34.28	35.71	46.0	-10.29	358	1.86

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amp (dB)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ (°)	EL (m)
43.58	2.01	12.60	28.27	47.83	34.17	40.0	-5.83	291	1.04
51.34	2.07	11.50	28.23	41.39	26.73	40.0	-13.27	166	1.07
231.76	3.87	12.62	27.49	48.44	37.44	46.0	-8.56	62	1.62
334.58	4.93	15.18	27.52	40.15	32.74	46.0	-13.26	48	1.94
355.92	5.12	15.50	27.66	41.85	34.81	46.0	-11.19	249	2.01
716.76	8.25	21.50	28.37	34.26	35.64	46.0	-10.36	217	3.13

**NOTE:**

1. Measurement uncertainty is 4.20 dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

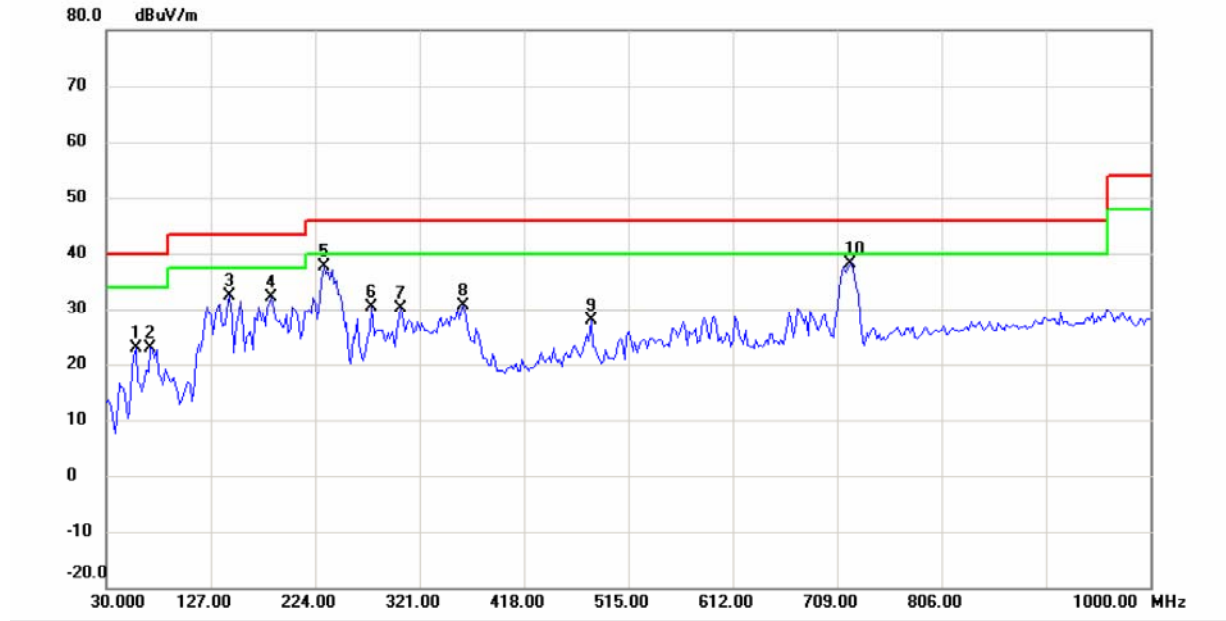


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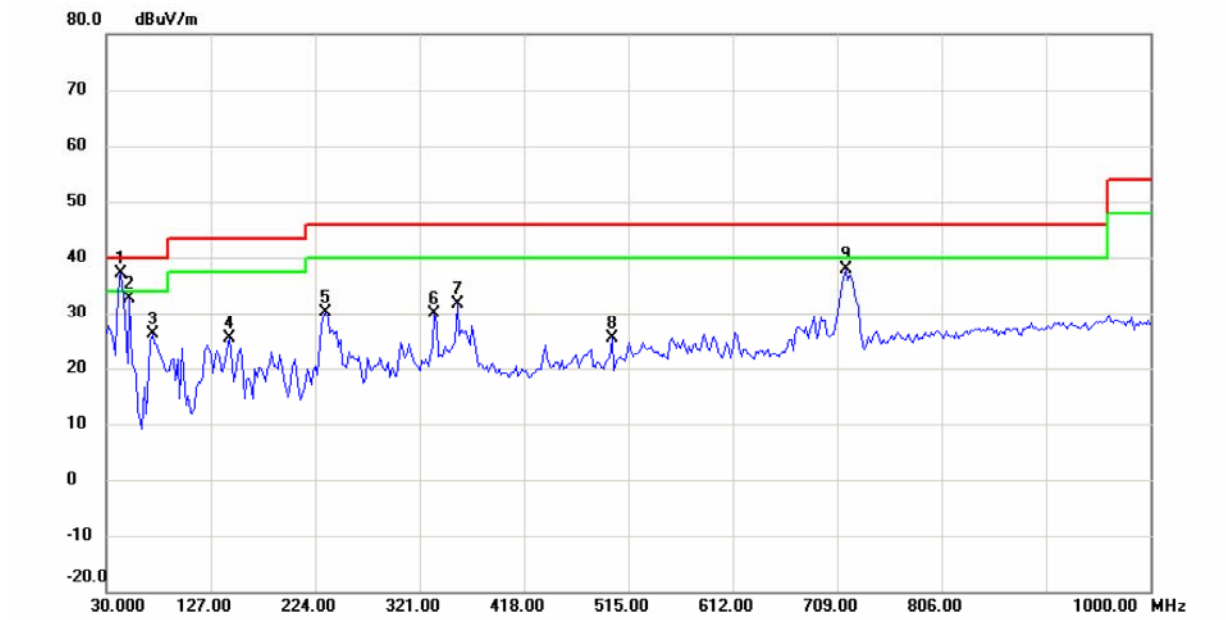
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## Antenna Polarization : Horizontal



## Antenna Polarization : Vertical



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Temperature: 29 °C Humidity: 76 %RH  
 Frequency Range: 30 MHz ~ 1 GHz Tested Mode: Link  
 Detector Type: Quasi-peak IF Bandwidth: 120 kHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 24, 2023

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amp (dB)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ (°)	EL (m)
50.78	2.06	11.50	28.23	44.25	29.58	40.0	-10.42	192	3.94
43.56	2.01	12.60	28.27	42.51	28.85	40.0	-11.15	210	3.96
48.44	2.04	11.90	28.24	39.68	25.38	40.0	-14.62	198	3.94
40.27	1.98	12.90	28.28	42.15	28.75	40.0	-11.25	356	3.97
35.06	1.83	13.50	28.29	30.28	17.32	40.0	-22.68	70	3.98
720.64	8.29	21.50	28.36	35.26	36.69	46.0	-9.31	230	1.86

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amp (dB)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ (°)	EL (m)
55.48	2.09	10.80	28.21	50.16	34.83	40.0	-5.17	52	1.04
49.75	2.05	11.70	28.24	42.62	28.14	40.0	-11.86	204	1.20
47.11	2.04	11.80	28.25	40.58	26.17	40.0	-13.83	50	1.64
39.12	1.95	13.00	28.28	41.32	27.99	40.0	-12.01	328	2.45
37.50	1.89	13.20	28.29	39.68	26.49	40.0	-13.51	328	2.50
39.23	1.95	13.00	28.28	35.24	21.91	40.0	-18.09	183	3.13

**NOTE:**

1. Measurement uncertainty is 4.20 dB.
2. "": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

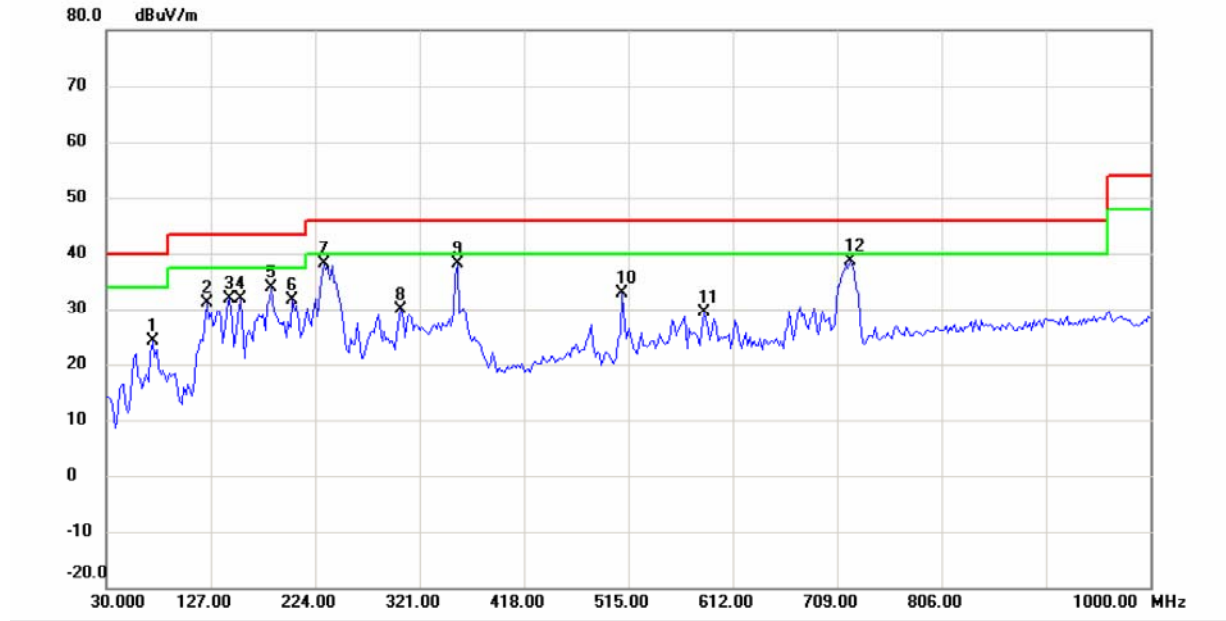


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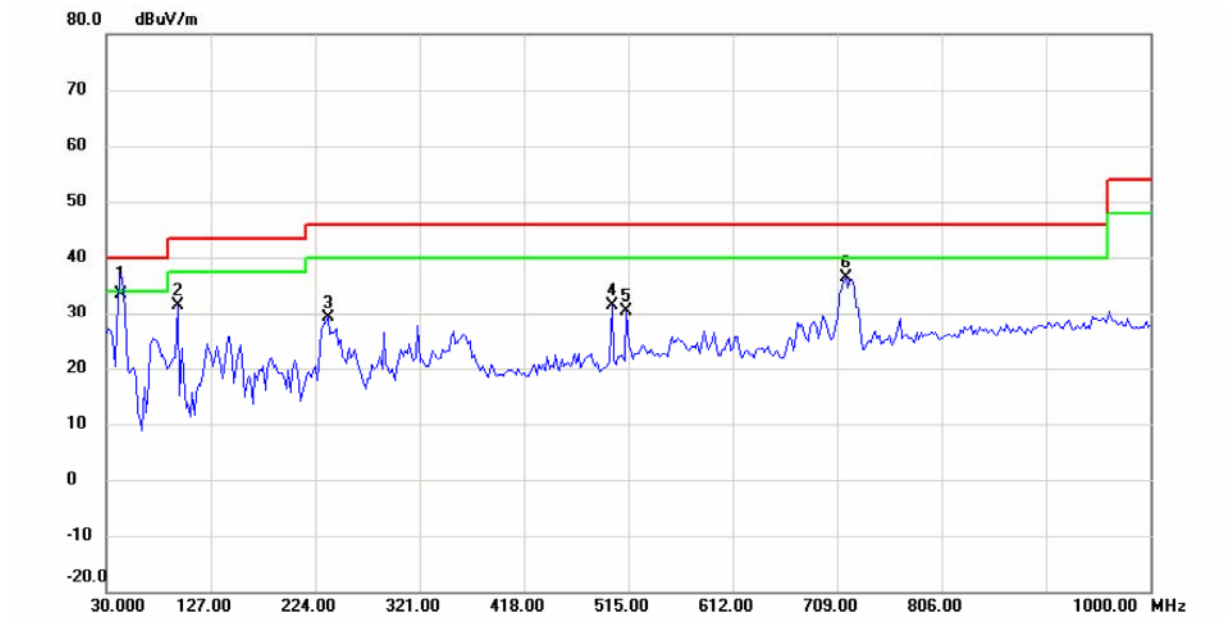
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Antenna Polarization : Horizontal



Antenna Polarization : Vertical





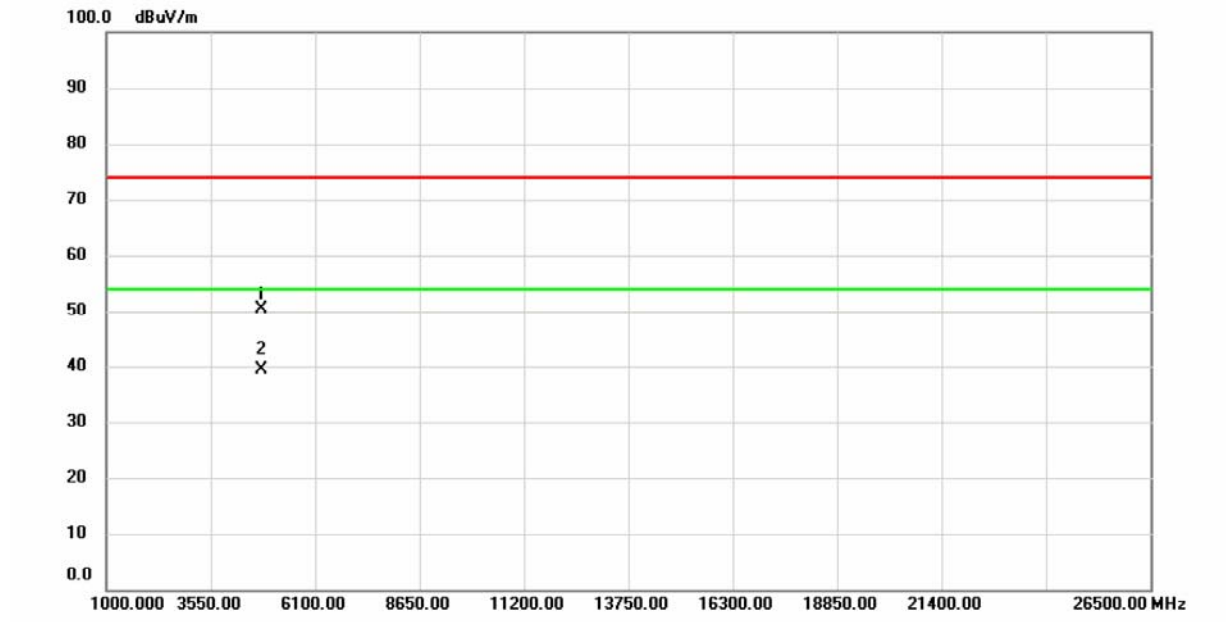
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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX1  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4803.395	44.40	6.06	50.46	74.00	-23.54	peak	
2	*	4803.820	33.22	6.06	39.28	54.00	-14.72	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



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# TEST REPORT

Reference No.: A23070303  
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 FCC ID : QCI-SKIWB800D3  
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 Date: Aug. 02, 2023

Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX1  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4803.570	44.29	6.06	50.35	74.00	-23.65	peak	
2	*	4803.965	34.45	6.07	40.52	54.00	-13.48	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.





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# TEST REPORT

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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX2  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4879.385	43.58	6.53	50.11	74.00	-23.89	peak	
2	*	4879.865	33.46	6.53	39.99	54.00	-14.01	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



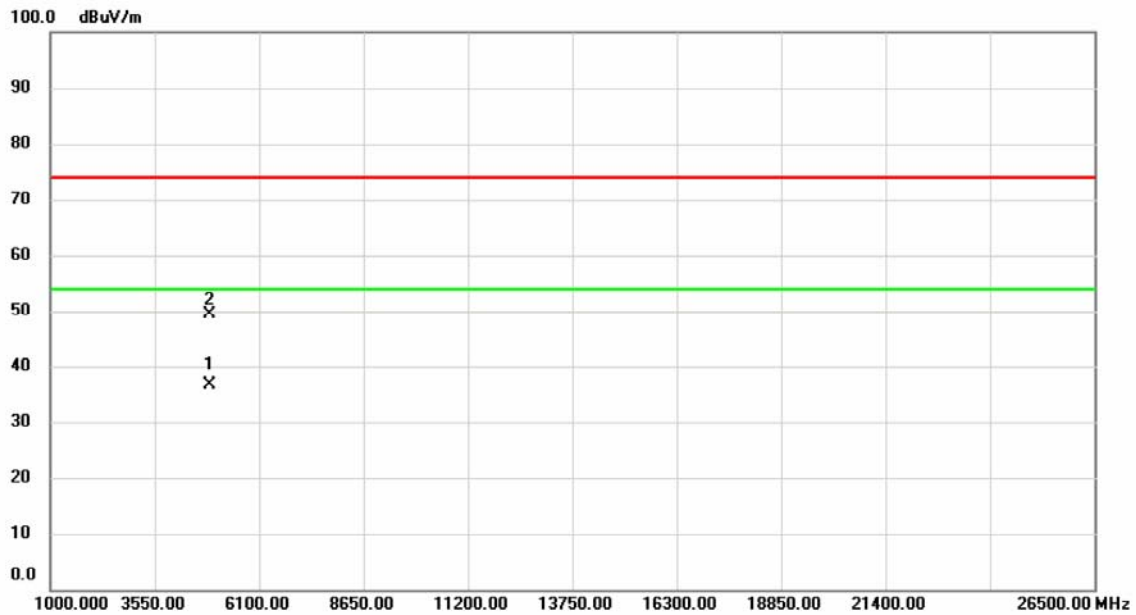
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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX2  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4880.010	30.15	6.53	36.68	54.00	-17.32	AVG	
2		4880.375	42.78	6.53	49.31	74.00	-24.69	peak	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX3  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4959.750	31.75	6.85	38.60	54.00	-15.40	AVG	
2		4961.660	42.93	6.86	49.79	74.00	-24.21	peak	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: BLE\_TX3  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4959.330	43.37	6.85	50.22	74.00	-23.78	peak	
2	*	4960.035	32.52	6.85	39.37	54.00	-14.63	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: Standby  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		3106.000	42.82	1.39	44.21	74.00	-29.79	peak	
2	*	3106.000	33.55	1.39	34.94	60.00	-25.06	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.



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Temperature: 27 °C Humidity: 76 %RH  
 Frequency Range: 1 ~ 25 GHz Tested Mode: Standby  
 Detector Type: PK. and AV. IF Bandwidth: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 22, 2023

Antenna Polarization : Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		3106.000	43.42	1.39	44.81	74.00	-29.19	peak	
2	*	3106.000	33.47	1.39	34.86	60.00	-25.14	AVG	

**NOTE:**

1. Measurement uncertainty is 4.04 dB.
2. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
3. The field strength of other emission frequencies were very low against the limit.
4. (F):The field strength of fundamental frequency.

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## 6. BANDWIDTH TEST

### 6.1 LIMIT

FCC Part15, Subpart C Section 15.247(a)(2).

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

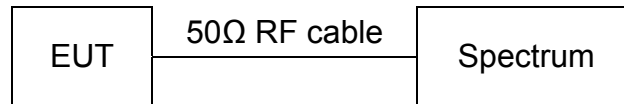
### 6.2 TEST EQUIPMENT

The following test equipment was used during the test :

Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center
R&S spectrum Analyzer	9KHz ~ 30GHz	R & S	100854 /	R&S spectrum Analyzer
E007	May 19, 2023			E007

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 6.3 TEST SET-UP



### 6.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

### 6.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

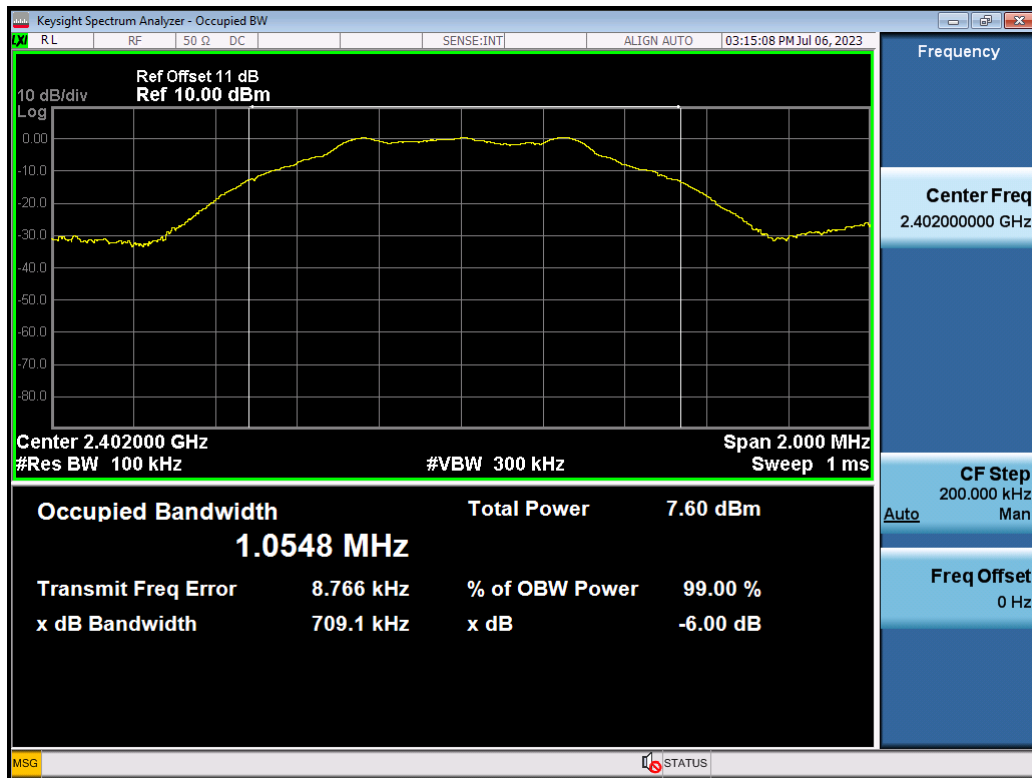
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## 6.6 TEST RESULT

Temperature: 18 °C Humidity: 77 %RH  
 RBW: 30 kHz Modulation: GFSK  
 Detector: Peak VBW: 100 kHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 26, 2023

Channel	Frequency (MHz)	6 dB Bandwidth (kHz)	BW > 500 kHz
CH00	2402	709.1	PASS
CH19	2440	710.7	PASS
CH39	2480	706.0	PASS

CH00 :





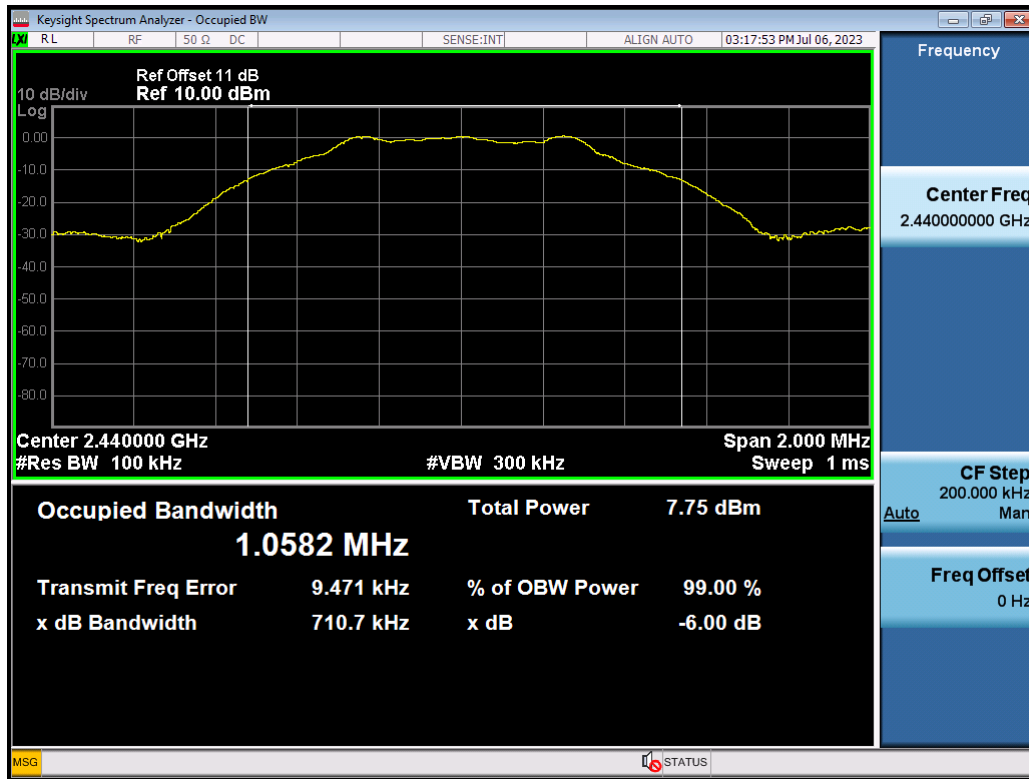


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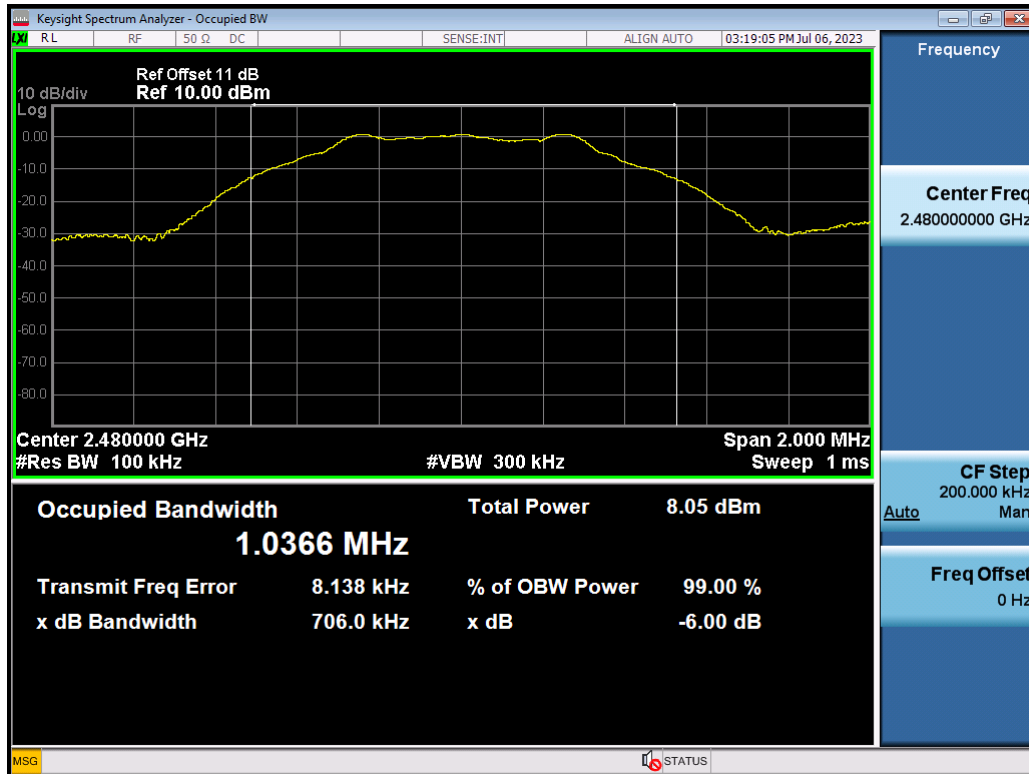
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CH19 :



CH39 :



## 7. PEAK CONDUCTED OUTPUT POWER TEST

### 7.1 LIMIT

FCC Part15, Subpart C Section 15.247(b).

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

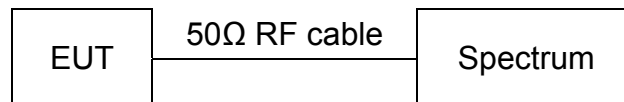
### 7.2 TEST EQUIPMENT

The following test equipment was used during the test :

Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center
R&S spectrum Analyzer	9KHz ~ 30GHz	R & S	100854 /	R&S spectrum Analyzer
E007	May 19, 2023			E007

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 7.3 TEST SET-UP



### 7.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel.

Printed out the test result from the spectrum by hard copy function.

### 7.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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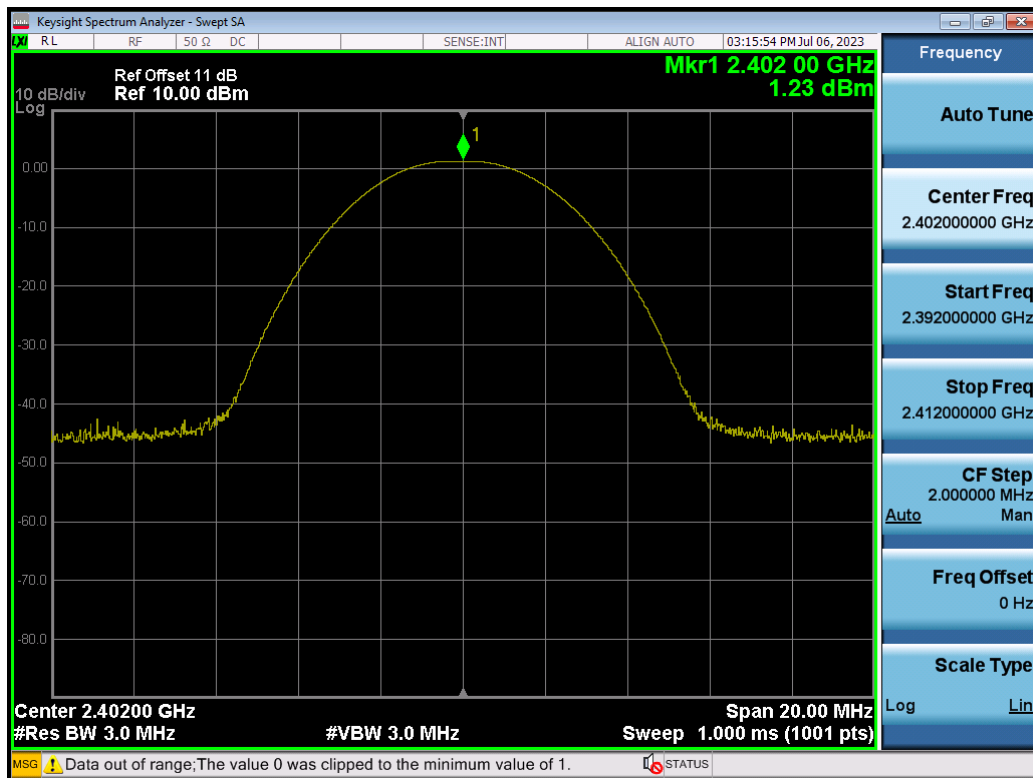
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## 7.6 TEST RESULT

Temperature: 18 °C Humidity: 77 %RH  
 Detector: Peak Modulation: GFSK  
 RBW: 3 MHz VBW: 3 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 26, 2023

Channel	Frequency (MHz)	Peak Conducted Output Power		Limit (dBm)
		(dBm)	(mW)	
CH00	2402	1.23	1.3274	30
CH19	2440	1.38	1.3741	30
CH39	2480	1.67	1.4689	30

CH00 :



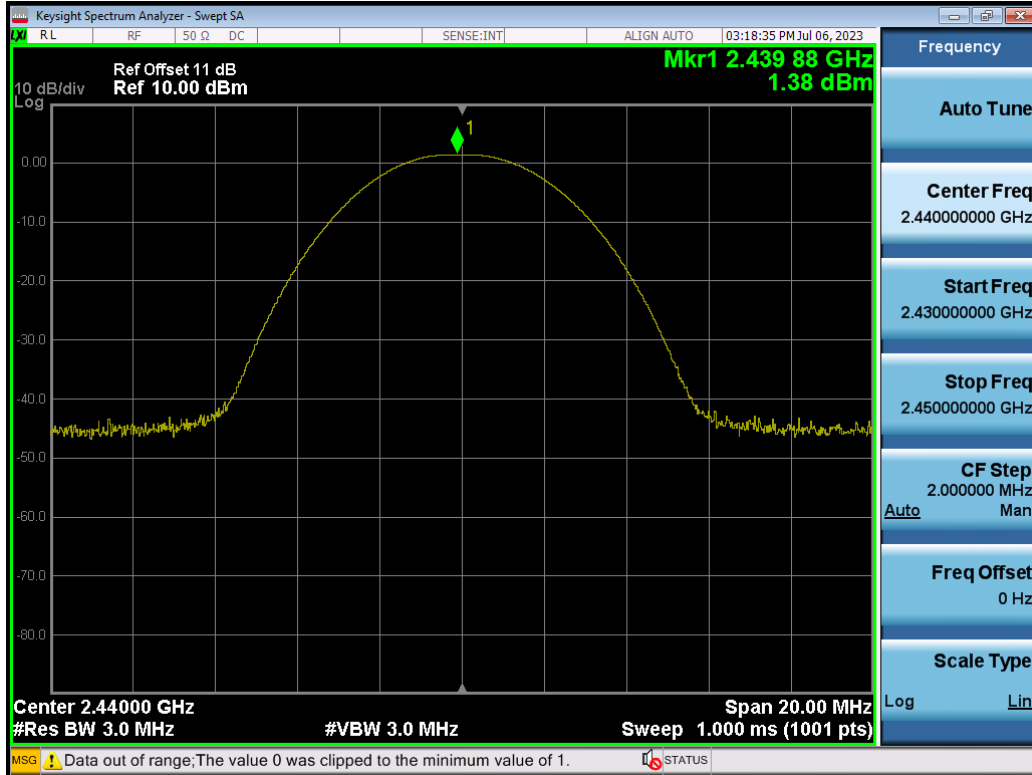


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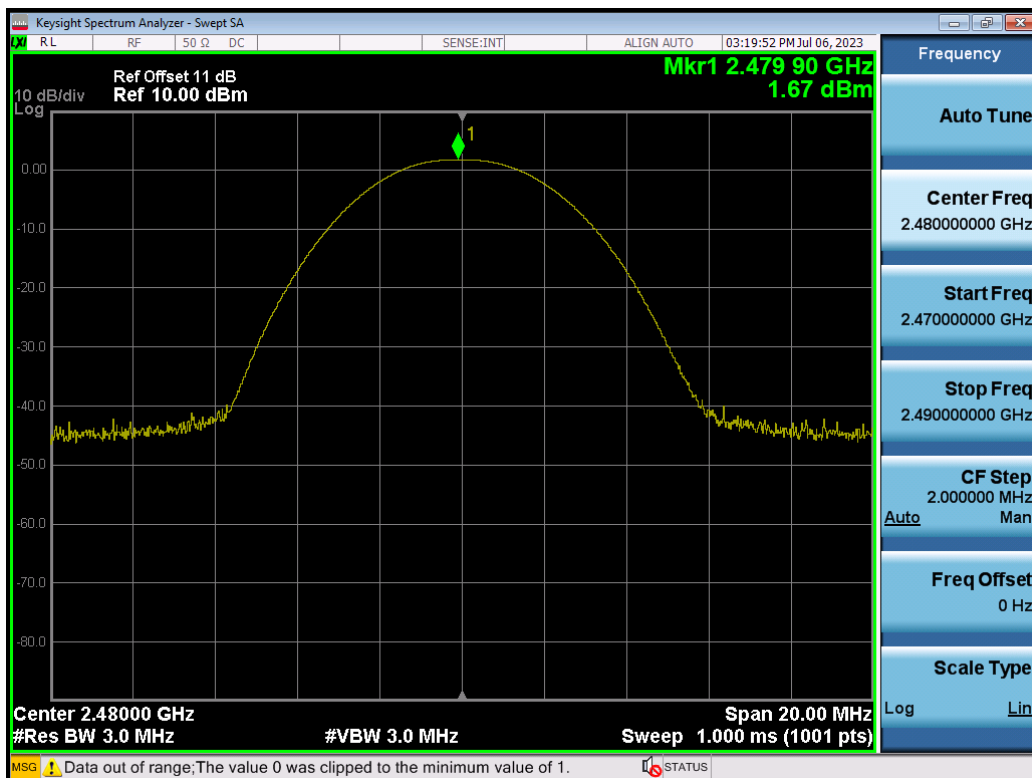
# TEST REPORT

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**8. BAND EDGE TEST**

**8.1 LIMIT**

FCC Part15, Subpart C Section 15.247(d).

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

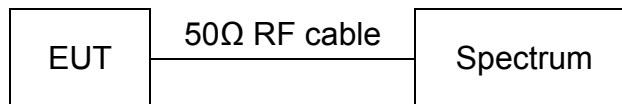
**8.2 TEST EQUIPMENT**

The following test equipment was used during the test :

Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center
R&S spectrum Analyzer	9KHz ~ 30GHz	R & S	100854 /	R&S spectrum Analyzer
E007	May 19, 2023			E007

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

**8.3 TEST SET-UP**





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## 8.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

## 8.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



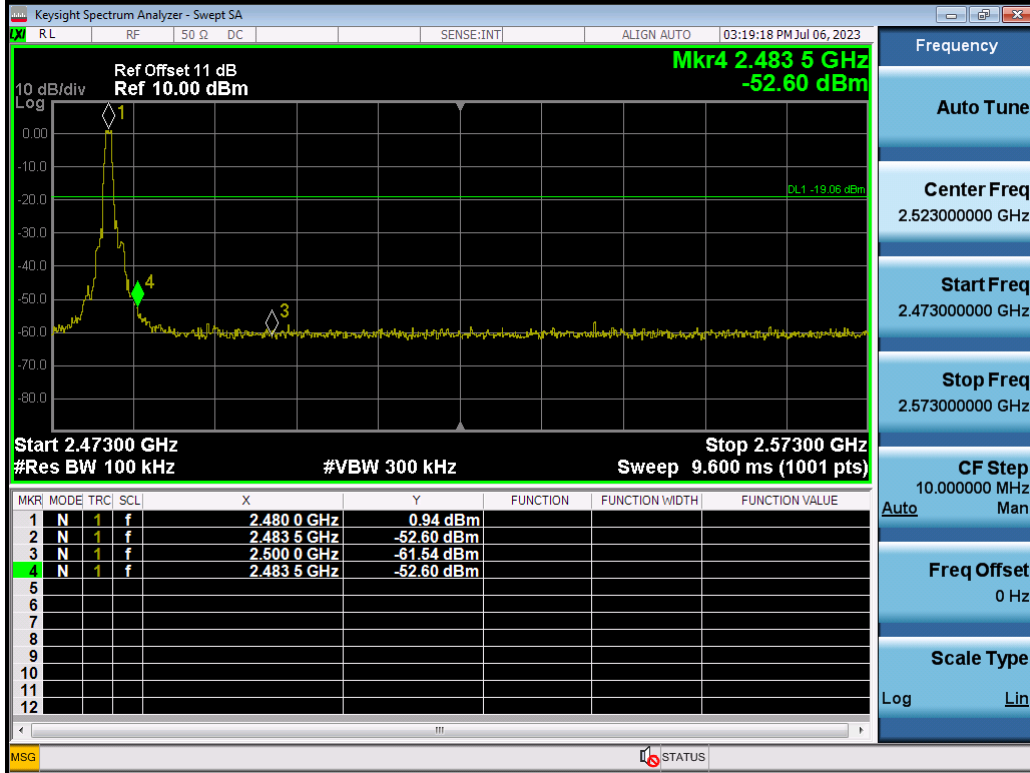


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## 9. POWER SPECTRAL DENSITY TEST

### 9.1 LIMIT

FCC Part15, Subpart C Section 15.247(e).

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

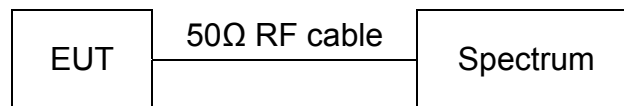
### 9.2 TEST EQUIPMENT

The following test equipment was used during the test :

Equipment/ Facilities	Specifications	Manufacturer	Model #/ Serial #	Due Date of Cal. & Cal. Center
R&S spectrum Analyzer	9KHz ~ 30GHz	R & S	100854 /	R&S spectrum Analyzer
E007	May 19, 2023			E007

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 9.3 TEST SET-UP



### 9.4 TEST PROCEDURE

The EUT was operating in continuous transmission mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

### 9.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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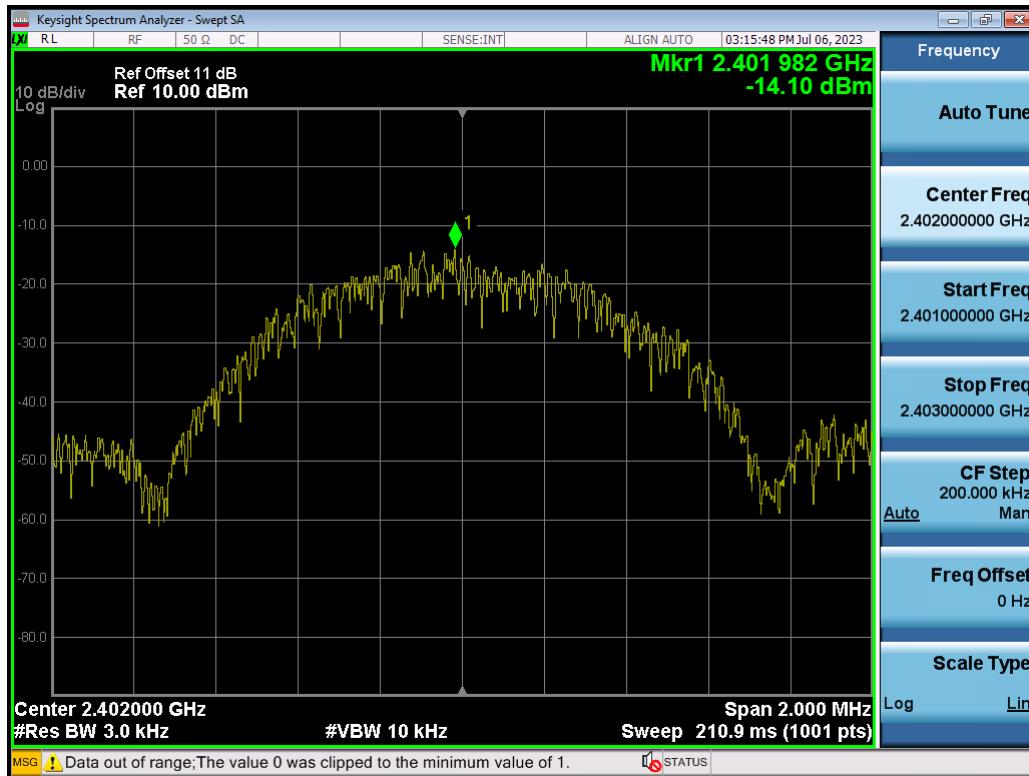
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## 9.6 TEST RESULT

Temperature: 28 °C Humidity: 70 %RH  
 Spectrum Detector: PK. Modulation: GFSK  
 RBW: 1 MHz VBW: 1 MHz  
 Tested By: Jimmy Tseng Tested Date: Jul. 06, 2023

Channel Number	Channel Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)
CH00	2402	-14.10	8
CH19	2440	-13.95	8
CH39	2480	-13.57	8

CH00 :



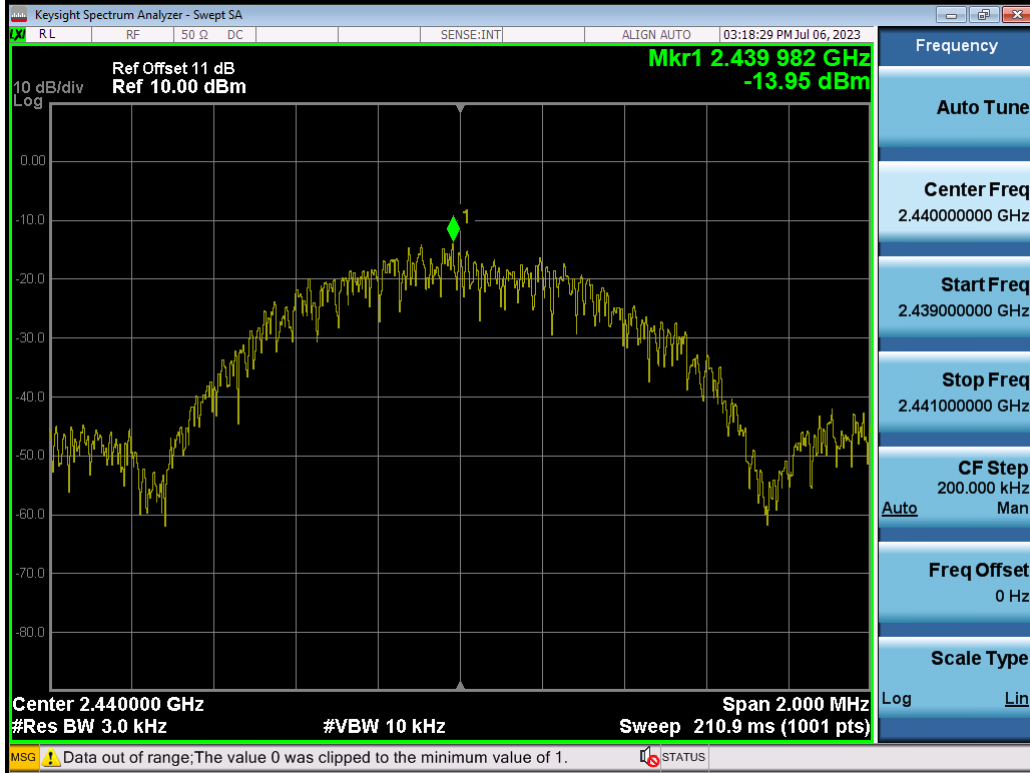


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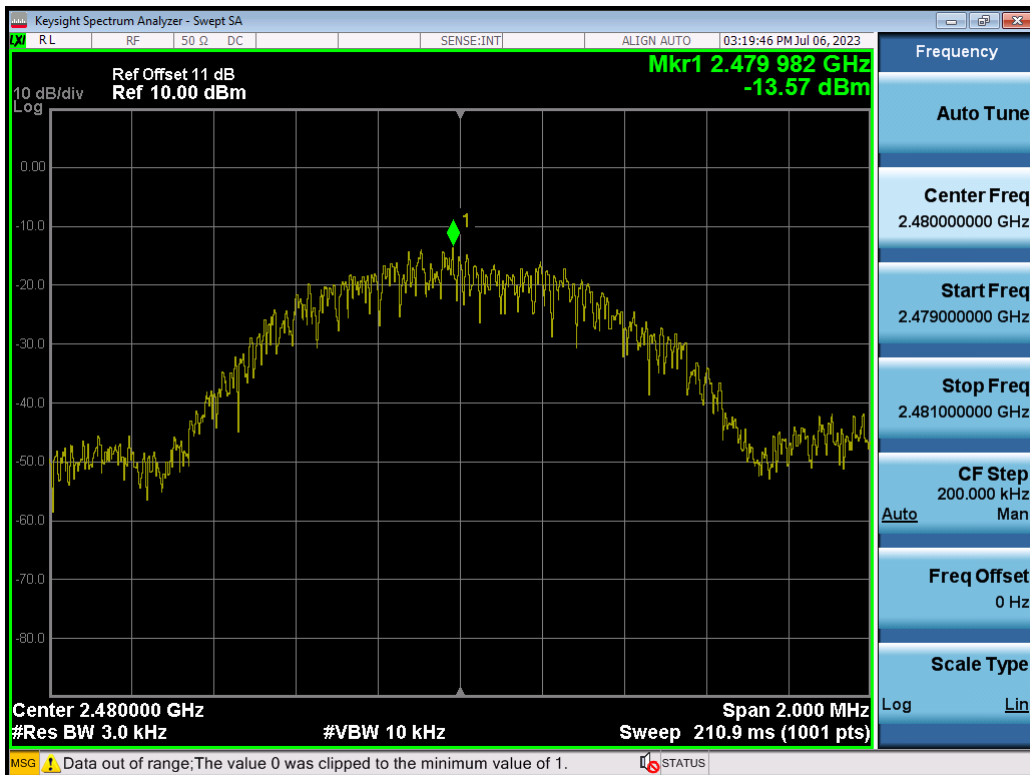
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## 10. Antenna application

### 10.1 Antenna requirement

FCC Part 15E section 15.407 requirement:

For the band 5.725-5.85 GHz, If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### 10.2 Result

The EUT's antenna used a Dipole Antenna . antenna gain is 3.09 dBi that meet the requirement.



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## 11. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction